Name: _____ Note Set 55

CHAPTERS 42-43: Animal Reproduction

Chapter 42

1. List and describe three modes of asexual reproduction.

   - _____

     _____

   - _____

     _____

   - _____

     _____

2. What is parthenogenesis and give an example of this process in nature.

_____

_____

3. What are the three key processes in sexual reproduction?

   _____ → _____ → _____

4. Define each of the following terms:

   a. gonads – _____

   b. testes – _____

   c. ovaries – _____

   d. germ cells – _____

   e. spermatogonia – _____

   f. oogonia – _____

   g. spermatid – _____

5. Explain how fertilization (sperm—egg interactions) is specific for each species.

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_____

6. What are the pros and cons of:

   a. external fertilization – _____

   _____

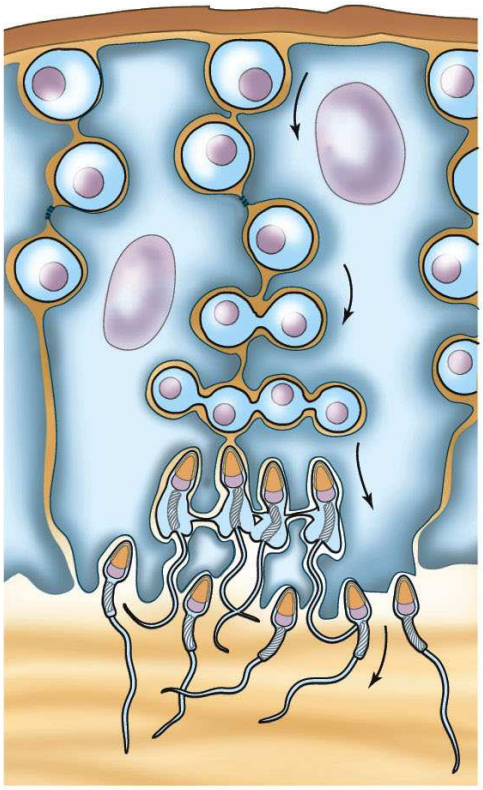
   _____

   b. internal fertilization – _____

   _____

   _____

7. Using **Figure 42.10**, the text, and on-line interactive, explain the process of spermatogenesis.



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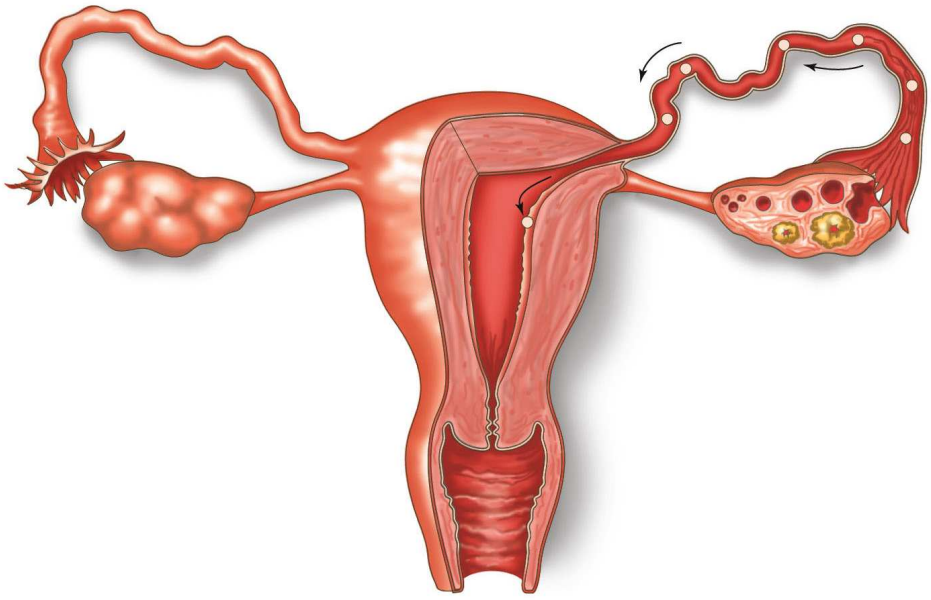
8. Using **Figure 42.20**, the text, and on-line interactive, label and describe the function of the parts of the human female reproductive tract.



9. Describe how each plays a role in regulating the ovarian and uterine cycles:

   a. GnRH – _____

   _____

   b. FSH – _____

   _____

   c. LH – _____

   _____

   d. estrogen – _____

   _____

   e. progesterone – _____

   _____

Chapter 43

10. What are the different regions of the egg cytoplasm? What is the significance of each

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11. What is the significance of the gray cresent?

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12. Define each of the following terms:

a. cleavage – _____
b. blastocoel – _____
c. blastula – _____
d. blastomeres – _____
e. complete cleavage – _____
f. incomplete cleavage – _____
g. superficial cleavage – _____
h. trophoblast – _____
i. blastocyst – _____
j. endoderm – _____
k. ectoderm – _____
l. mesoderm – _____

13. Explain using **Figure 43.2** and the test how B-catenin becomes concentrated in only certain blastomeres.

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14. Describe the function of an embryonic organizer.

_____

_____

15. Describe how one aspect of organogenesis, neurulation occurs.

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_____

16. Explain what Hox genes are and how they instruct patterns of differentiation along the body axis.

_____

_____

_____

_____

17. Describe each of the four extraembryonic membranes in a developing chick egg.

- _____ - _____
- _____ - _____
- _____ - _____
- _____ - _____

18. Describe the role of the trophoblast/placenta in placental mammals.

_____

_____

_____

19. Describe two ways that testing can check for genetic disease in a human fetus. Indicate what genetic abnormalities can be detected and what causes them.

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END OF CHAPTER 42 MULTIPLE CHOICE

1. A species in which the individual possesses both male and female reproductive systems is termed
   A) dioecious.
   B) parthenogenetic.
   C) hermaphroditic.
   D) monoecious.
   E) ovoviviparous.

2. The major advantage of internal fertilization is that
   A) it ensures paternity.
   B) it permits the fertilization of many gametes.
   C) it reduces the incidence of destructive competitive interactions between the members of a group.
   D) it increases the number of sperm that have access to each egg.
   E) it gives the developing organism a greater degree of protection during the early phases of development.

3. Which statement about oocytes is true?
   A) At birth, the human female has produced all the oocytes she will ever produce.
   B) At the onset of puberty, ovarian follicles produce new oocytes in response to hormonal stimulation.
   C) At the onset of menopause, the human female stops producing oocytes.
   D) Oocytes are produced by the human female throughout adolescence.
   E) Oocytes produced by the female are stored in the oviducts.

4. Spermatogenesis and oogenesis differ in that
   A) spermatogenesis produces gametes with greater stores of raw materials than those produced by oogenesis.
   B) spermatocytes remain in prophase of the first meiotic division longer than oocytes.
   C) oogenesis produces four equally functional haploid cells per meiotic event and spermatogenesis does not.
   D) spermatogenesis produces many gametes with meager energy reserves, whereas oogenesis produces relatively few, well-provisioned gametes.
   E) spermatogenesis begins before birth in humans, whereas oogenesis does not start until the onset of puberty.

5. Semen contains all of the following *except*
   A) fructose.
   B) mucus.
   C) clotting enzymes.
   D) substances to lower the pH of the uterine environment.
   E) substances to increase the contraction of the uterine muscle.

6. During oogenesis in mammals, the second meiotic division occurs
   A) in the formation of the primary oocyte.
   B) in the formation of the secondary oocyte.
   C) before ovulation.
   D) after fertilization.
   E) after implantation.

7. One of the major differences between the sexual responses of human males and females is
   A) the increase in blood pressure in males.
   B) the increase in heart rate in females.
   C) the presence of a refractory period in females.
   D) the presence of a refractory period in males after orgasm.
   E) the increase in muscle tension in males.

8. Which of the following is true of sexually transmitted diseases?
   A) They are always caused by viruses or bacteria.
   B) Using contraception will prevent them.
   C) The organisms that cause them have evolved to depend on intimate physical contact between hosts as their means of transmission.
   D) Their transmission has a high probability of failure.
   E) You cannot catch one from someone you love.

9. Contractions of muscles in the uterine wall and in the breasts are stimulated by
   A) progesterone.
   B) estrogen.
   C) prolactin.
   D) oxytocin.
   E) human chorionic gonadotropin.

10. Which method of contraception is most likely to fail?
    A) Rhythm method
    B) Birth control pills
    C) Diaphragms
    D) Vasectomy
    E) Condoms

END OF CHAPTER 43 MULTIPLE CHOICE

11. Fertilization involves all of the following except
    A) joining of most cell organelles from sperm and egg.
    B) joining of sperm and egg haploid nuclei.
    C) induction of rearrangements of the egg cytoplasm.
    D) sperm binding to specific sites on the egg surface.
    E) metabolic activation of the egg.

12. Which of the following does not occur during cleavage in frogs?
    A) A high rate of mitosis
    B) Reduction in the size of cells
    C) Expression of genes critical for blastula formation
    D) Orientation of cleavage planes at right angles
    E) Unequal division of cytoplasmic determinants

13. How does cleavage in mammals differ from cleavage in frogs?
    A) Slower rate of cell division
    B) Formation of tight junctions
    C) Expression of the embryo's genome
    D) Early separation of cells that will not contribute to the embryo
    E) All of the above

14. Which statement about gastrulation is true?
    A) In frogs, gastrulation begins in the vegetal hemisphere.
    B) In sea urchins, gastrulation produces the notochord.
    C) In birds, cells from the surface of the blastodisc move down through the primitive groove to form the hypoblast.
    D) In mammals, gastrulation occurs in the hypoblast.
    E) In sea urchins, gastrulation produces only two germ layers.

15. Which of the following was a conclusion from the experiments of Spemann and Mangold?
    A) Cytoplasmic determinants of development are homo-geneously distributed in the amphibian zygote.
    B) In the late blastula, certain regions of cells are determined to form skin or nervous tissue.
    C) The dorsal lip of the blastopore can be isolated and will form a complete embryo.
    D) The dorsal lip of the blastopore can initiate gastrulation.
    E) The dorsal lip of the blastopore gives rise to the neural tube.

16. Which of the following is true of human development?
    A) Most organs begin to form during the second trimester.
    B) Gastrulation takes place in the oviducts.
    C) Genetic diseases can be detected by sampling cells from the chorion.
    D) Implantation occurs through interactions of the zona pellucida with the uterine lining.
    E) Exposure to drugs and chemicals is most likely to cause birth defects when it occurs in the third trimester.

17. Which of the following characterizes neurulation?
    A) The notochord forms a neural tube.
    B) The neural tube is formed from ectoderm.
    C) A neural tube forms around the notochord.
    D) The neural tube forms somites.
    E) In birds, the neural tube forms from the primitive groove.

18. Which statement about trophoblast cells is true?
    A) They are capable of producing monozygotic twins.
    B) They are derived from the hypoblast of the blastocyst.
    C) They are endodermal cells.
    D) They secrete proteolytic enzymes.
    E) They prevent the zona pellucida from attaching to the oviduct.

19. Which membrane is part of the embryonic contribution to placenta formation?
    A) Amnion
    B) Chorion
    C) Epiblast
    D) Allantois
    E) Zona pellucida

20. A major factor in the determination and differentiation of tissues along the anterior–posterior axis of the mouse is the
    A) differential expression of Hox genes.
    B) concentration gradient of β-catenin.
    C) differential expression of the sonic hedgehog gene.
    D) distance of the tissue from the gray crescent.
    E) distribution of GSK-3, which degrades β-catenin.